2023-2024

NamazuContest 2023-2024

Episode 2

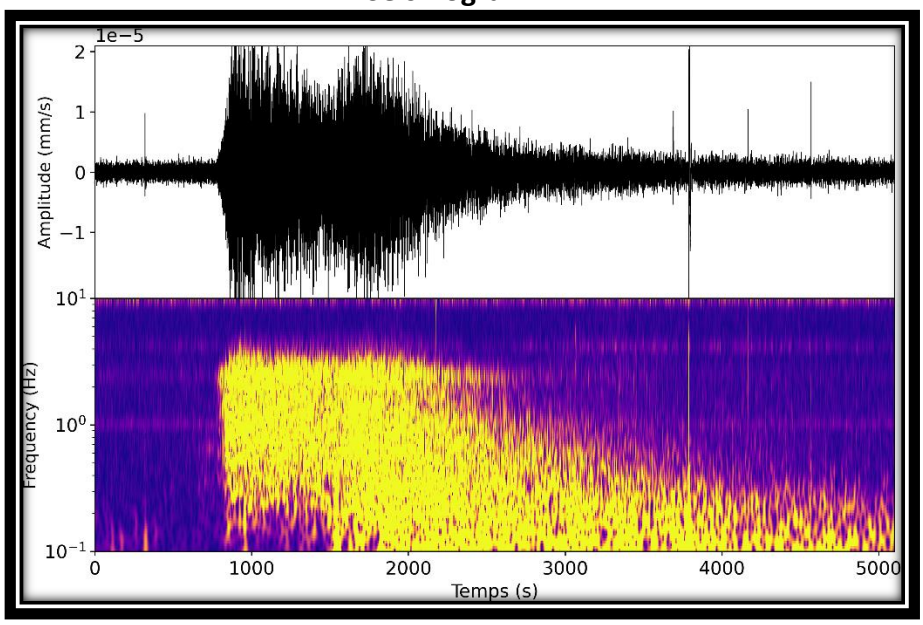
Enigmas announced Nov. 6, 2023;
answers before Dec. 15, 2023 to
➢ ***insight@geoazur.unice.fr***

Level of difficulty

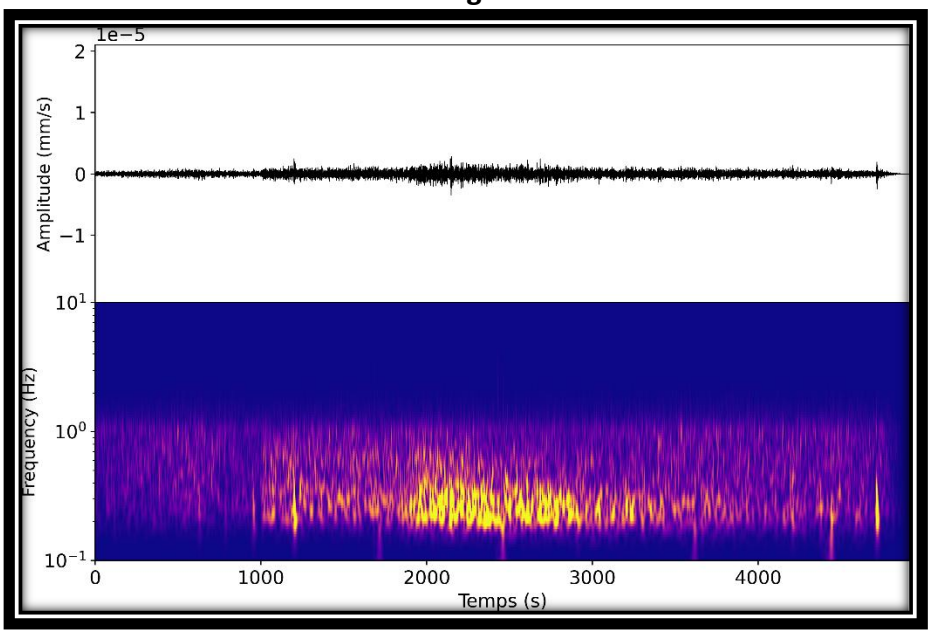
By examining the seismic waves that SEIS detected during two quakes in 2021, scientists were able to deduce that the liquid core of Mars is smaller and denser than previously thought.

Let's take a closer look at the recordings that the InSight scientific team worked on !

Seismogram A



Seismogram B



The two recordings are available online on:
https://insight.oca.eu/fr/data-insight

Here is some questions about the waves that may have passed through the core of Mars.

Question 1. Which is which?

- Quake of August 25, 2021 **>** seismogram ☐ A or ☐ B
- Quake of September 18, 2021 **>** seismogram ☐ A or ☐ B

- have you read the InSight Education newsletter n° 40?

Question 2. What is the date, in Martian Sol, of these marsquakes?

- Quake of August 25, 2021 **>** Sol _____
- Quake of September 18, 2021 **>** Sol _____

A tool to help you answer this question:
- *https://insight.oca.eu/fr/data-insight*

Question 3. marsquake or impact ?

One of these quakes was clearly interpreted, by the scientific team, as a meteor impact by the researchers, which one is it?

L'impact correspond à la secousse ☐ du August 25th, 2021 ou ☐ du September 18th, 2021.

Some research is necessary on
- *https://insight.oca.eu/fr/data-insight#marsview*

Question 4. By looking at the seismograms of these two quakes, make a list of the observable differences between the two recordings.

Make a list of the observed differences, cite at least 3 differences.
Answer :

Question 5. With the help of marsview (http://namazu.unice.fr/marsview/), observe the arrival time of the waves for both studied events.

Identify the farthest quake from SEIS: _____

Question 6. With the help of the application Marsview, localize the origin point of the event which generated the quake of August the 25th, 2021.

Localization of the marsquake: is it n° 1 ou n° 4 ou n° 6 or n° 21 … on the map of Marsview?
Answer: _____

Question 7. Let us compare the core model of Mars with the core model of the Earth.

Represent same scale models of the internal structure of the Earth and of Mars with respect to the size of the planets and their cores. All of your models should be of the same scale.

Question 8. It also happens of Earth that seismometers record seismic waves generated by earthquakes occuring on the other side of the planet.

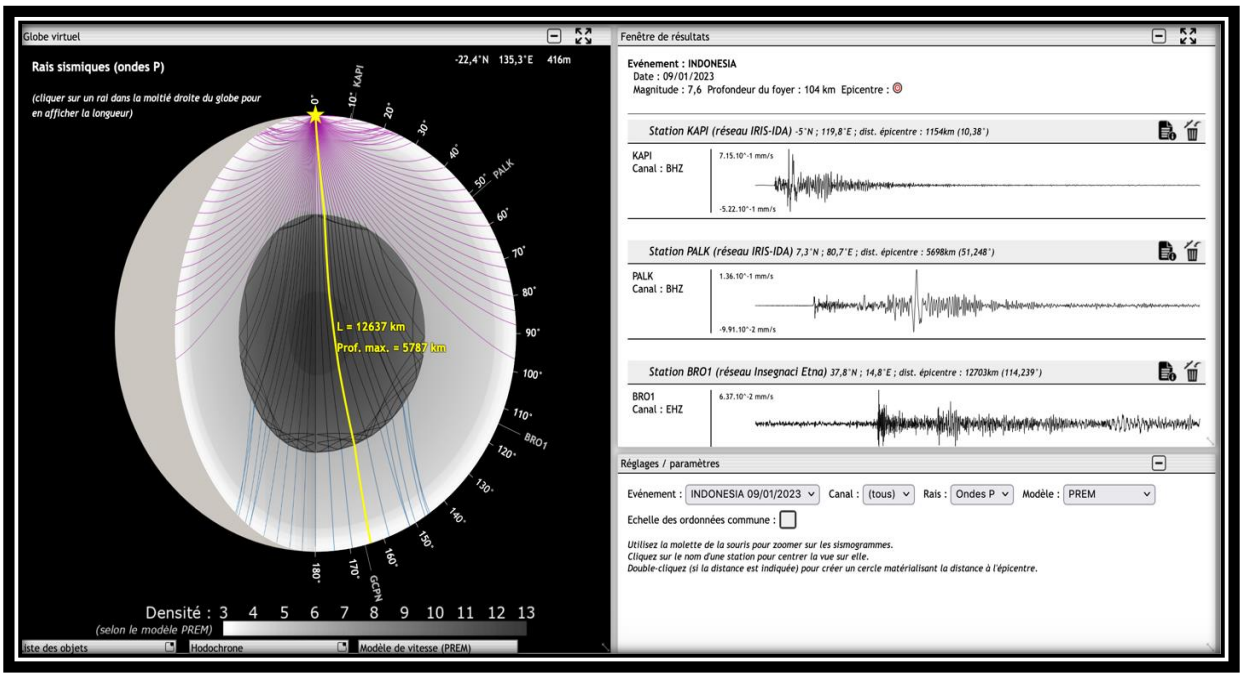
Take the example of the powerful earthquake (magnitude=7,6) that occured in Indonesia on January 9, 2023, and was recorded by numerous stations around the world.

The recordings resulting from this earthquake are available on the data base of EDUMED.
http://edumed.unice.fr/data-center/seismo/seismograms.php

Open the recordings with Tectoglob3D, and observe the available seismograms.

With the option **'project the stations on the globe'** from the menu **'seismogram'**, compare the path traveled by seismic waves in the terrestrial globe by projecting the stations on the globe.

Thanks to all these elements, we can calculate the speed of the waves with the best precision. At what average speed do the first seismic waves propagate in each case (for each station)?



Question 9. For this earthquake, one of the seismological stations is located in the shadow zone of the earthquake.

Indicate which station it is.
Answer: _____

Question 10. On the recording of this station (in the shadow zone), we notice the arrival of waves, albeit weak.

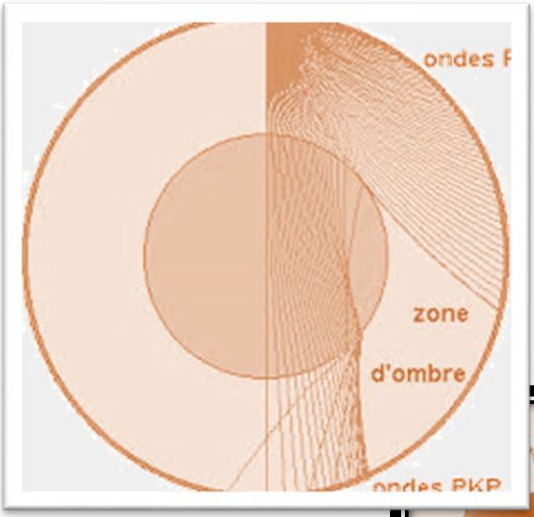
How can we explain these seismic waves recorded despite the obstacle represented by the core of the Earth?

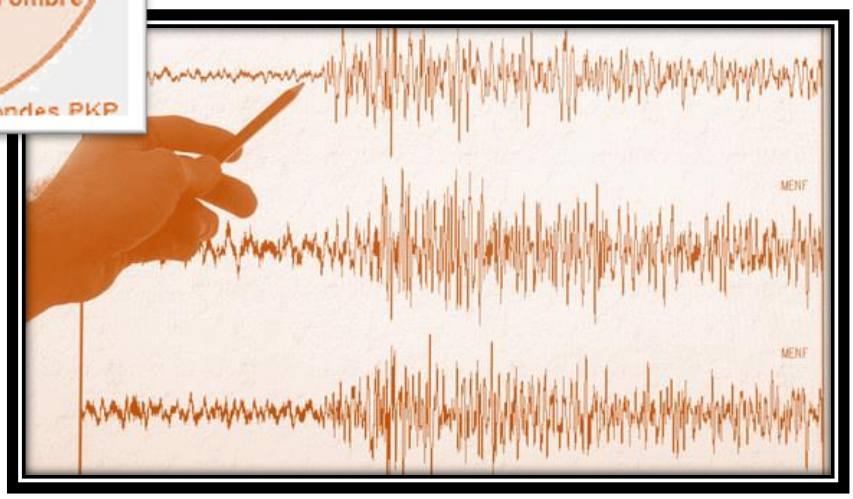
Question 11. Experiment to be carried:

Imagine and create a model with simple material to illustrate a shadow zone…

It should be seen in your experience that the presence of a nucleus in a globe or a container deflects or creates an obstacle to the propagation of waves such as light or other waves.

This experiment may be photographed and/or filmed.





Episode 1 :
Technical problem

Following a technical problem with the email address '*namazu@geoazur.unice.fr*', if you have not received a confirmation email from us that we have received your participation, please send us your answers of **Episode 1** ***insight@geoazur.unice.fr***

We await for your results and discoveries on:
insight@geoazur.unice.fr

Enjoy the discoveries and until January for the continuation of the adventure !